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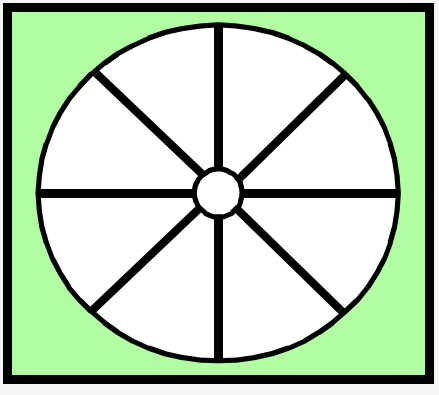
From a p r i s m a Management Technologies

SPECTRUM Enterprise Manager

Device Management

Cabletron Ethernet Hubs



Supports Management Module SM-CSI1000

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Introduction

This section introduces the SPECTRUM Device Management documentation for ethernet hubs manufactured by Cabletron.

This introduction contains the following topics:

- *Purpose and Scope*
- *Required Reading*
- *Supported Devices* (Page 6)
- *The SPECTRUM Model* (Page 6)

Purpose and Scope

Use this document as a guide for managing the Cabletron devices described on Page 6 with SPECTRUM management module SM-CSI1000. This document describes the icons, menus, and views that enable you to remotely monitor, configure, and troubleshoot Cabletron devices through software models in your SPECTRUM database.

Information specific to SM-CSI1000 is what is primarily included in this document. For general information about device management using SPECTRUM and explanations of SPECTRUM functionality and navigation techniques, refer to the topics listed under *Required Reading*.

Required Reading

To use this documentation effectively, you must be familiar with the information covered by the other SPECTRUM online documents listed below.

- ***Getting Started with SPECTRUM for Operators***
- ***Getting Started with SPECTRUM for Administrators***
- ***How to Manage Your Network with SPECTRUM***
- ***SPECTRUM Views***
- ***SPECTRUM Menus***
- ***SPECTRUM Icons***
- ***SPECTRUM Software Release Notice***

Supported Devices

SPECTRUM management module SM-CSI1000 currently lets you model the Cabletron Ethernet Hub family of devices.

The SPECTRUM Model

Table 1 provides the Model Type Names for the Cabletron Ethernet hubs and a brief description of the intelligent hub module devices supported by the Cabletron Ethernet Hubs management module.

Note: If you have installed both the Hub_CSI_MRXi (Cabletron Ethernet Hubs Management Module) and the HubCSIMRXi (MRXI-24 Management Module), and are going to model an MRXI or MRXI-2, make sure you select the Hub_CSI_MRXi (MRXI/MRXI-2) model type from the Select Model Type menu, NOT the HubCSIMRXi (MRXI-22 or 24) model type.

Table 1: Model Type Names

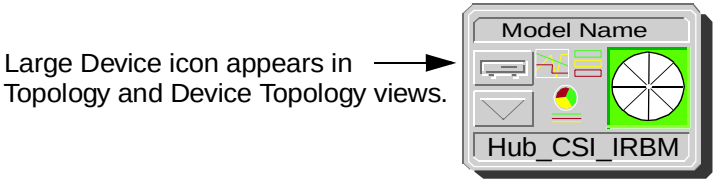
Model Type Name	Hub Description
Hub_CSI_IRBM	An Intelligent Repeater Bridging Module (IRBM) managed through the Simple Network Management Protocol (SNMP) only. This module includes bridging functionality that is similar to a Cabletron SNMP NB25.
Hub_CSI_IRM2	An Intelligent Repeater Module-2 (IRM2) managed through SNMP only.
Hub_CSI_IRM3	An Intelligent Repeater Module-3 (IRM3) managed through SNMP only.
Hub_CSI_SIRM	An Intelligent Repeater Module (IRM) managed through SNMP only.
Hub_CSI_MRXi	An MRXI intelligent repeater module managed through SNMP only.
Hub_CSI_MiniM	A MiniMMAC intelligent repeater module managed through SNMP only.

Modeling results in the creation of Device icons that represent the devices and Application icons that represent their supported applications.

The Device icons contain double-click zones and provide access to Icon Subviews menus that let you perform device management activities such as those listed in *Tasks* on Page 9.

Figure 1 shows the appearance of the Device icon.

Figure 1: Device Icons



The device-specific Icon Subviews menu options available from the Device icon are listed below.

Option	Accesses the...
Device	*Device View* (Page 10)
Device Topology	*Device Topology View* (Page 26)
Application	*Application Views* (Page 27)
Configuration	*Configuration Views* (Page 43)

Terminology

This section defines several terms used in this guide to describe Cabletron Ethernet hub and board model types.

Hub Chassis

The software model representation of an MMAC with no boards installed in its slots. An MMAC chassis can have three, five, or eight slots.

Media Interface Modules (MIMs)

The software model representations of boards installed in an MMAC hub chassis. For the purposes of this guide, the term MIM will

represent all MIMs that can be installed in a Cabletron hub.

Intelligent MIMs

MIMs that provide network management functions and network media interfacing.

Non-intelligent MIMs

MIMs that provide interfaces to different kinds of network media, but have no network management capabilities.

Single-Port Interface Modules (SPIMs)

For the MRXI and MiniMMAC hubs, this term is used to represent the non-intelligent MIMs that can be installed in these hub chassis types.

The rest of this document covering the Cabletron Ethernet Hubs management module is organized as follows.

- *Tasks* (Page 9)
- *Device View* (Page 10)
- *Device Topology View* (Page 26)
- *Application Views* (Page 27)
- *Performance Views* (Page 41)
- *Configuration Views* (Page 43)
- *Diagnostic View* (Page 69)

Tasks

This section contains an alphabetical list of device management tasks, with each task providing one or more links to views that let you perform the task.

Alarm Thresholds (set)

- *Configure Alarms View* (Page 49)

Application Information (check)

- *Application Views* (Page 27)

Configuration Information (check)

- *Configuration Views* (Page 43)

Hub Redundancy (configure)

- *Hub Redundancy Management* (Page 63)

IP Address (find/change)

- *Device View* (Page 10)

MIM Representation (change)

- *Changing MIM Representations* (Page 24)

Performance (check)

- *Device View* (Page 10)
- *Device View Banner* (Page 11)
- *Performance Views* (Page 41)

Topology (check)

- *Device Topology View* (Page 26)

Device View

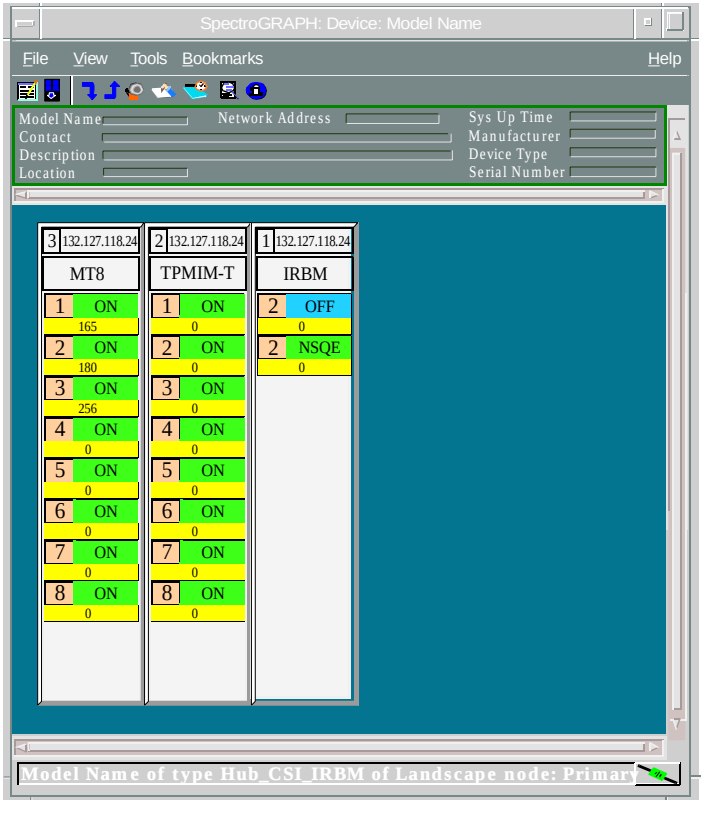
This section describes the Device view and subviews available for models of Cabletron Ethernet Hubs in SPECTRUM.

Access: *From the* ***Icon Subviews*** *menu for the Device icon, select* ***Device > Logical*** *or* ***Device > Physical****.*

This view allows you to view a logical or physical representation of the Media Interface Modules (MIMs) installed in a hub. The logical MIM representation shows a port status label and a logical gauge, while the physical MIM representation shows the actual physical appearance of the module and its LEDs. The view provides dynamic configuration and performance information for each of the device's serial and network I/O ports, which are represented by Interface icons in the bottom panel of the view.

Figure 2 (Page 10) displays an example of a Cabletron Ethernet Hub Device View.

Figure 2: Device View



Note: The Hub_CSI_MRXi and Hub_CSI_MiniM model types do not support the Logical/Physical submenu, and provide access to the Logical Device View through the Device menu item.

Device View Banner

The top portion of the IRM, IRM2, IRM3, and IRBM Logical Device Views displays the following information. A condition status banner surrounding this information displays the condition status color for the device, with the exception of Flashing Green, which is only valid for the Contact Status Label.

Model Name
The user-defined or default model name.

Net Address
The Internet Protocol (IP) address assigned to the device.

Sys Up Time
The time the device has been active without failure, displayed in the following format: days+hours:minutes:seconds.

Contact
The textual identification and contact information of the person responsible for managing the device.

Manufacturer
The manufacturer of the device.

Description
A textual description of the device. This description may include the name and version of the hardware type, the software operating system, and the networking software.

Device Type
A hardware description of the device being modeled.

Location
The location of the device as entered in the Creation dialog box when the model was created. If no location has been specified, this field displays the model name of the SPECTRUM location view containing the device.

Serial Number
The serial number of this device.

MMAC Device Panel

The top portion of a MiniMMAC hub Device View displays an MMAC Device Panel. The IRBM, IRM, IRM2, and IRM3 Device Views also display the

Device Panel when accessed by selecting the Physical Device View from the Icon Subviews Menu. The MMAC Device Panel appears in the Device View in both the logical and physical MIM representations. The MMAC Device Panel displays the following information about the hub.

Name
The user-defined or default model name for the hub.

Location
The location of the device as entered in the Creation dialog box when the model was created. If no location has been specified, this field displays the model name of the SPECTRUM location view containing the device.

Net Address
The IP address of the hub.

Device Type
The SPECTRUM model type name of the hub.

System UpTime
The time the hub has been active without failure. The time is displayed in the following format: *days+hours:minutes:seconds*

The MMAC Device Panel also provides a **Logical Gauges** button and a **Gauge Mode** button. These buttons allow you to change the type of statistical information presented in the Logical MIM horizontal bar gauges. The Logical MIM bar gauges appear under the name of the module (e.g., IRM2) and under each module port. The following sections describe how these buttons work.

Logical Gauges

The Logical Gauges button lets you change the statistics represented in the horizontal gauges for the entire MMAC. The horizontal gauges can display a given statistic as either a percentage or a rate, depending on the setting of the **Gauge Mode** button. When you single-click on the Logical Gauges button, a menu appears. Table 2 (Page 13) provides a list of the Logical Gauge menu options.

Gauge Mode

The Gauge Mode button allows you to change the gauge representation of the selected statistic. Table 3 (Page 14) provides a list of the Gauge Mode menu options.

Table 2: Logical Gauge Menu Options

Option	Definition
Frames	Indicates frames received or transmitted by the module or port.
Bytes	Indicates bytes received or transmitted by the module or port.
Recv_Colls	Indicates collisions detected by the module or port while receiving data.
Trans_Colls	Indicates collisions generated by the module or port during transmission.
Total_Errors	Indicates errors detected by the module or port.

Table 2: Logical Gauge Menu Options

Option	Definition
Align_Errors	Indicates misaligned packets detected by the module or port.
CRC_Errors	Indicates packets with bad Cyclical Redundancy Checks (CRCs) received by the module or port.
Runts	Indicates runt packets received by the module or port. Runt packets are packets that are less than the standard Ethernet frame of 64 bytes, not including preamble.
Giants	Indicates giant packets received by the module or port. A giant packet exceeds 1518 bytes not including preamble.
OutOfWindow	Indicates collisions out of the standard window (51.2µs) due to a network problem.

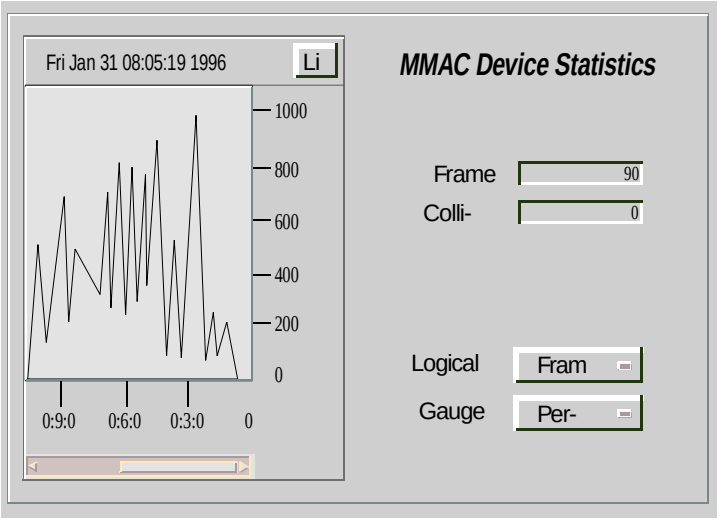
Table 3: Gauge Mode Menu Options

Option	Definition
Percentages	Displays the selected statistic as a percentage of the total statistics for the module.
Rates	Displays the selected statistic as a rate over a given time frame.

MMAC Device Statistics Panel

The top portion of the MRXI Device View and the IRM Device View (when accessed by selecting **Physcial** from the Device View submenu) displays the MMAC Device Statistics Panel. This panel displays the Frame Rate and Collision Rate information for the hub. Each rate is color-coded to correspond to the Multi-Attribute Line Graph. Figure 3 shows an example of the MMAC Device Statistics Panel.

Figure 3: MMAC Device Statistics Panel



Three buttons are available on the MMAC Device Statistics Panel. These buttons allow you to change the statistical presentation of the Multi-Attribute Line Graph or the Logical MIM horizontal bar gauges. The buttons and their functions are as follows.

Log/Lin

This button allows you to toggle between a logarithmic and a linear scale presentation of the multi-attribute line graph.

Logical Gauges

This button allows you to change the statistics represented in the horizontal gauges for the entire MMAC. When you single-click on the Logical Gauges button, a menu appears. The horizontal bar gauge changes color depending on the statistic being represented. The following table provides a list of the menu options and their corresponding gauge color definitions.

Table 4: Logical Gauges Menu Options

Menu Option	Gauge Color	Definition
Frame	Light blue	Indicates the number of frames received or transmitted by the module or port.
Collisions	Yellow	Indicates the total number of collisions detected by the module or port.

Gauge Mode

The Gauge Mode button allows you to change the gauge representation of the selected statistic.

Logical MIM Representation

The logical MIM representation provides information about the individual modules. For information on the Device View physical MIM representation, see *Physical MIM Representation* on Page 17.

The logical MIM representation provides port status labels and double-click zones that provide access to information on each module installed in the hub. The logical MIM representation also provides the following double-click zones.

Port Number

Indicates the port number. You can double-click on the port number to bring up a notes window.

Port Status

Indicates the status of the port. You can double-click on this zone to bring up the *Port Performance View* (Page 42). When you have accessed the Logical MIM representation through the Physical MIM representation, double-clicking the Port Status Label opens the Port Administration Status dialog box. If you have write privileges, you can double-click on this zone to change the port administration status from ON to OFF or from OFF to ON. Table 5 (Page 16) provides the port status values.

Port Performance

Indicates the frame rate for the port. You can change this display using the Gauge Control Panel, which is described later in this chapter. When you have accessed the Logical MIM representation through the Physical MIM representation, the Port Performance label displays a gauge. The rates or percentages measured by this gauge depend on the setting of the Logical Gauges and Gauge Mode buttons. You can double-click on the Port Performance Gauge to bring up the *Port Performance View* (Page 42).

Table 5: Port Status Values

Status	Color Code
NLNK (No link)	Yellow
ON	Green
OFF	Blue
SEG (Segmented)	Red
NSQE	Green (IRBM)
SQE	Green (IRBM)
CL	Blue (IRBM)

You can also access several generic views from the View and Device Menu pulldown menus. These generic views include:

- *Configuration Views* (Page 43)
- *Performance Views* (Page 41)
- *Diagnostic View* (Page 69)
- *Application Views* (Page 27)
- Display Logical/Physical MIMs

The procedures for displaying these generic views are given in the section titled *Changing MIM Representations* (Page 24).

Note: Some modules may not support logical MIM representations. Refer to the specific module's hardware documentation.

Gauge Control Panel

Access: *Select the right-most module icon in the hub chassis to highlight it and then select* ***Gauge Control Panel*** *from the* ***Icon Subviews*** *menu.*

The Gauge Control Panel allows you to change the type of statistical information presented in the Port Performance label of the Logical MIM Representation.

Selected Attribute

This area of the Gauge Control Panel allows you to select the statistical attribute displayed on the Logical Interface Icon's Gauge. The label changes color to reflect the attribute selected.

Gauge Mode

This area of the Gauge Control Panel allows you to select the mode presented by the Logical Gauge. Possible selections are Totals, Rates, or Percentages. The Percentages selection represents the percentage of the interface compared to the rest of the interfaces, and is not currently supported. Once you select these attributes, click the Gauge Control Panel Apply button to activate the mode represented in the Logical Gauge Label.

Gauge Type

This option allows you to select either a numeric or linear representation of the Logical Gauge.

Gauge Control Panel Buttons

The following buttons are available in the Gauge Control Panel.

Apply

Apply the Selected Attribute selection(s) to the Port Performance label. The settings cannot be saved.

Keep Settings

Save the current settings while running SpectroGRAPH.

Reset

Reset back to the last Keep Settings selections.

Close

Close the Gauge Control Panel and reset back to the default attribute of Frame Rate.

Default

Return all settings to their default values.

Physical MIM Representation

The Physical MIM Representation of the hub shows each of the modules installed in the hub along with the current LED status conditions (on or off). The Physical MIM Representation gives you the same access to generic views as the Logical MIM Representation.

Figure 4 and Figure 5 are examples of Device Views showing modules in a physical representation.

Figure 4: Physical MIM Representation of IRM2, IRM3 and IRBM Device Views

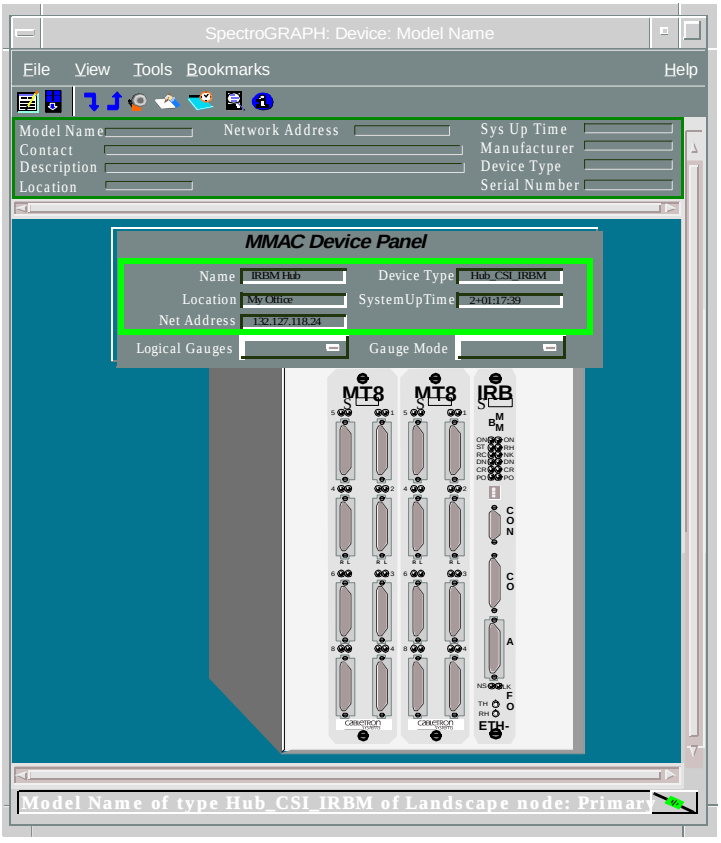
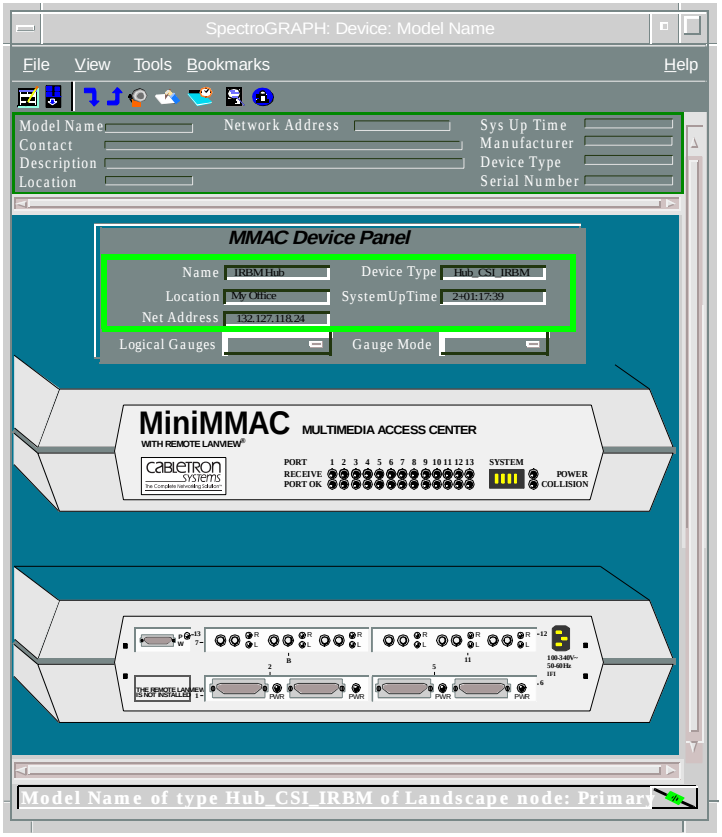


Figure 5: Physical MIM Representation of MiniMMAC Device View



Port Source Address View

The Port Source Address View is available from the IRBM, IRM2, IRM3, and MiniMMAC Device Views. This view allows you to display the Source Address information for the port. To open the Port Source Address View, follow these steps.

1. Click on the port icon with the right mouse button to display the port Icon Subviews menu.
2. Select Port Source Address View from the menu.

You can also display the Port Source Address View as follows.

1. Click on the port icon to highlight it.
2. Select Icon Subviews from the View menu.
3. Select Port Source Address View from the Icon Subviews menu.

The Port Source Address View displays the following information.

Name
The user-defined or default name for the hub.

Network Address
The IP address of the hub.

Device Type
The SPECTRUM model type name of the hub.

Slot/Port Number
The slot number and the port number in this format: 1.1 (Slot number 1, Port number 1).

Source Address Table
The list of Source Addresses for the port. The print button allows you to print out a copy of the table to a printer or a file.

Cabletron Hub LEDs

This section describes the LEDs available on Cabletron Systems intelligent modules for the MMAC hub chassis types and the LEDs available on the front panel of the MRXI and MiniMMAC. You can see these LEDs in the Physical Representation of the Device View. For more specific information on LEDs, refer to the corresponding Cabletron hardware installation manual.

SIRM Hubs

The SIRM supports LEDs that represent operating status, collision rates, error rates, packets transmitted and packets received for the entire hub as follows.

Fail (Error)
This LED is located on the top of the left-hand LED column. It indicates that a problem has been detected with the SIRM.

CLN (Collision Present)
This LED is located on the top of the right-hand LED column and is not labelled in SPECTRUM. It indicates that the SIRM is detecting a collision signal from one of the segments connected to the hub.

Unlabeled 1
This LED is located below the Fail LED. It indicates that the SIRM is receiving network management packets.

Unlabeled 2
This LED is located below the CLN LED. It indicates that the SIRM network management software is on line and functional.

The SIRM modules also contain an RCV and POK LED that are associated with its repeater port and its network management port.

IRM2 Hubs

The IRM2 supports LEDs that represent operating status, collision rates, error rates, packets transmitted, and packets received for the entire hub as follows. The LEDs are listed in top to bottom order, except where otherwise noted.

ER (Error)
This LED indicates that a problem has been detected with the IRM2.

PW (Power)
This LED indicates that the hub is receiving power.

RC (Receive)
This LED indicates the IRM2 is repeating a data packet received from one of the segments connected to the hub chassis.

XM (Transmit)
This LED indicates that the IRM2 is transmitting a data packet out to all other segments connected to the hub chassis.

CL (Collision Present)
This LED indicates the IRM2 is detecting a collision signal from one of the segments connected to the hub chassis.

PO (Port OK)
This LED is lit to indicate that the Network Interface Chip associated with the IRM2's internal repeater port has passed an internal Loop Back Test and is ready for transmission.

P1 (Port 1 OK)
This LED is lit to indicate that the Network Interface Chip associated with the IRM-2's external repeater port has passed an internal Loop Back Test and is ready for transmission.

R1(Receive 1)
This LED is located to the left of the P1 LED. It indicates the IRM2 is repeating a data packet received from the segment connected to the IRM2 AUI Port or Fiber Optic Port.

LN (Link)
This LED is located below the IRM2's AUI port. It indicates that a link has been established between the fiber optic port on the IRM2 and the fiber optic device at the other end of the fiber optic link segment.

IRM3 Hubs

The IRM3 supports LEDs that represent operating status, collision rates, error rates, packets transmitted and packets received for the entire hub as follows.

PW (Power)
This LED is located at the top of the left-hand LED column. It indicates that the IRM3 is receiving power from the MMAC.

OK (Board OK)
This LED is located at the top of the right-hand LED column. If this LED is lit, the module is operating properly. If this LED is not lit, there is an initialization problem. You may need to press the Reset switch.

RC (Receive)
This LED is located below the OK LED. It indicates that the IRM3 is repeating a packet received from a connected segment.

MM (Management)
This LED is located below the PW LED. It indicates that the IRM3 is receiving or transmitting management packets.

CL (Collision)
This LED is located below the MM LED. It indicates that a collision has been detected on a segment.

PO (Port OK)
This LED is located below the RC LED. It indicates that the internal repeater port is OK.

ON (AUI)
This LED is located above the AUI port and to the left of the PW LED. It indicates that the AUI port is the active repeater port.

PW (Power)
This LED is located above the AUI port and to the right of the ON LED. It indicates that the AUI port is receiving power.

ON (FO)
This LED is located below the AUI port and to the left of the LN LED. It indicates that the fiber optic port is the active repeater port.

LNK (Link)
This LED is located below the AUI port and to the right of the ON LED. It indicates that a link has been established between the port and the fiber optic device.

IRBM Hubs

The IRBM is divided into two sets of LEDs. One set, located in the right-hand LED column, is associated with the IRBM's repeating functions and a second set is associated with the IRBM's bridging functions. The repeater set has the same functions as the LEDs described for the IRM2. The bridging set of LEDs is as follows.

ON (On Line)
This LED is located at the top of the left-hand LED column. It indicates that the IRBM's bridging functionality is on line and operational.

ST (Stand By)
This LED is located below the ON LED. It indicates that the IRBM's bridging functionality is in the standby mode and is not capable of forwarding packets.

RC (Receive)
This LED is located below the ST LED. It indicates that the IRBM's bridge port is receiving data packets.

XM (Transmit)
This LED is located below the RC LED. It indicates that the IRBM's bridge port is transmitting packets to the segment connected to it.

CP (Collision Present)
This LED is located below the XM LED. It indicates that a collision is occurring on the segment connected to the IRBM's bridge port. On some IRBMs, this LED may be labelled CP.

PO (Power)
This LED indicates that the hub is receiving power.

MRXI Hubs

The MRXI supports LEDs that represent operating status, collision rates, error rates,

packets transmitted and packets received for the entire hub as follows.

POWER
This LED indicates that the hub is receiving power.

LNK (Link)
This LED indicates that a link has been established between the module and the 10BASE-T device at the other end of the twisted pair segment. This LED remains lit as long as the link is maintained. The link LED flashes to indicate that the hub has established a link with reversed polarity.

RCV (Receive)
This LED indicates that the hub is receiving a data packet on that segment.

COLLISION
This LED indicates that a collision is occurring on a system level.

MGMT (Management)
When flashing, this LED indicates that the MRXI's network management software is receiving a packet directed toward management.

FAULT
This LED indicates than an error has been detected by the MRXI's software.

XMT (Transmit)
This LED indicates that the hub is transmitting packets to the segment connected to it.

MiniMMAC Hubs

The MiniMMAC supports LEDs that represent network activity and operating status, as follows.

PORT OK
This LED indicates that the corresponding port is not segmented from the network and is ready to transmit or receive packets from a segment attached to the port.

RECEIVE
This LED indicates that the MiniMMAC is receiving a data packet from the segment attached to the corresponding port.

POWER
This LED indicates that the MiniMMAC is receiving power.

COLLISION
This LED indicates that the MiniMMAC has detected a collision on one of its ports.

FLT (Fault)
This LED is located on the back of the MiniMMAC. It indicates that an error has been detected by the MiniMMAC's software.

XMT (Transmit)
This LED is located on the back of the MiniMMAC. It indicates that the hub is transmitting packets to the segment connected to it.

Changing MIM Representations

You can change the MIM representation of the entire hub or the MIM representation of selected modules in the hub. The following sections describe several methods for changing MIM representations.

Changing MIM Representations on the Entire Hub

To change the representation of the entire hub Device View, follow these steps:

1. Within the hub Device View, pull down the Device Menu.
2. Select either the Display Physical MIMs or Display Logical MIMs menu option. The appearance of the hub changes to the selected MIM representation.

Changing MIM Representations on a Single Module Using the Menu Bar

To change the representation of a single module using the menu bar, follow these steps:

1. From the Physical representation of the Device View, move the mouse pointer onto the module. Single-click the left mouse button.
2. Select the Icon Subviews from the View menu.
3. Select the Go Logical menu option. The selected module changes its appearance and appears to extend from the hub chassis.

Note: This procedure works only when you are viewing the Physical representation of modules and you want to change to a Logical representation

Changing MIM Representations on a Single Module Using the Mouse

To change the MIM representation of a single module using the mouse, follow these steps:

1 From the Physical representation of the Device View, move the mouse pointer onto the module.

Note: Make sure that the mouse pointer is not on top of, or next to, a gauge or port connector (depending on the initial MIM presentation) otherwise a Port Performance View will open.

2 Double-click the left mouse button. The appearance of the selected module changes. A selected single module appears to extend from the hub chassis.

3 Double-click the left mouse button again to return the module to its original appearance.

Note: This procedure works only when you are viewing the Physical representation of modules and you want to change to a Logical representation.

Device Topology View

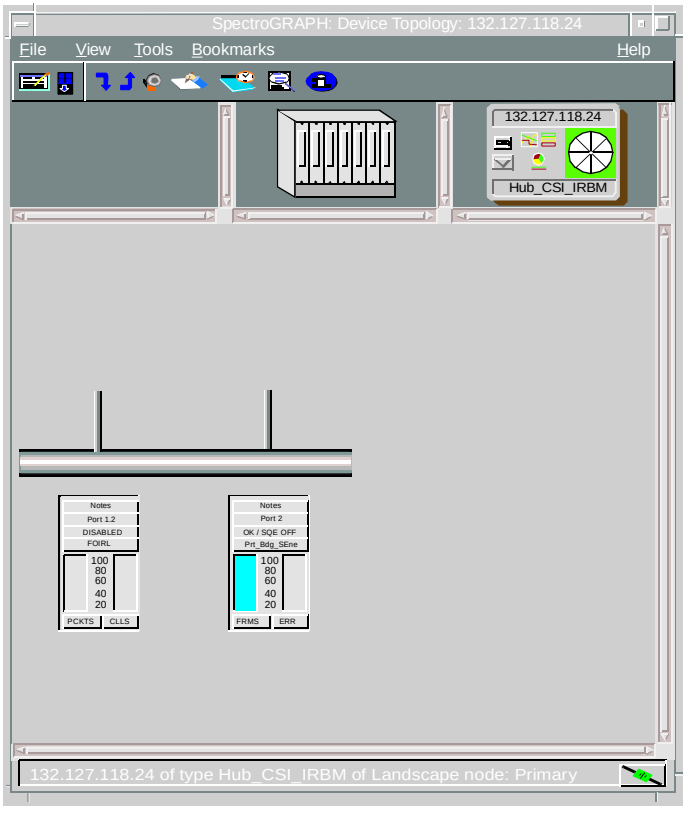
This section describes the Device Topology view available for models of Cabletron ethernet hubs.

Access: *From the **Icon Subviews** menu for the Device icon, select **DevTop**.*

The Device Topology view (Figure 6) shows the connections between a modeled device and other network entities. The lower panel of the view uses Interface icons to represent the device's serial, network, and I/O ports. These icons provide the same information and menu options as those in the *Device View* (Page 10). If a device is connected to a particular interface, a Device icon appears on the vertical bar above the Interface icon along with an icon representing the network group that contains the device.

Refer to the ***SPECTRUM Views*** documentation for details on Device Topology view.

Figure 6: Device Topology View



Application Views

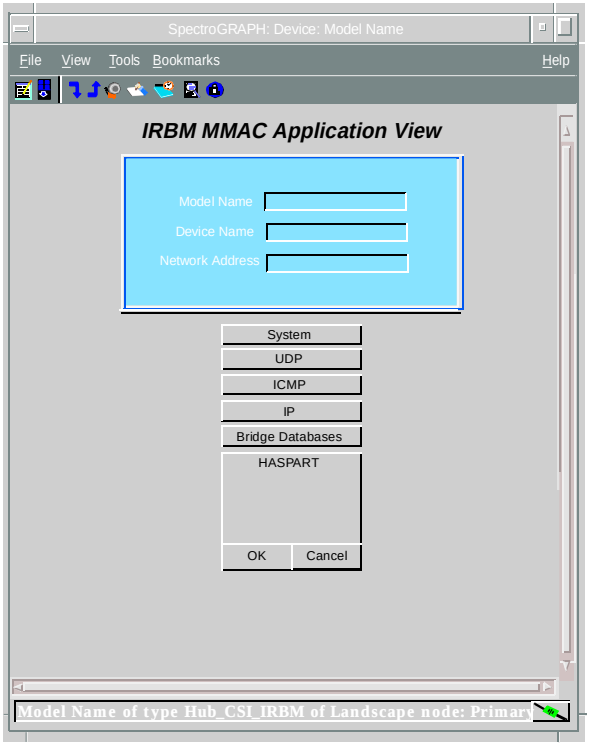
This section describes the main Application view and the associated application-specific subviews available for models of Cabletron ethernet hubs in SPECTRUM.

Access: *From the* ***Icon Subviews*** *menu for the Device icon, select* ***Application****.*

Main Application View

This view provides buttons that allow you to access increasingly detailed views of network information, and table entries within views that provide you with double-click zones that navigate to device-specific information views. The view presents protocol related performance and error statistics for a device. Protocols covered include TCP/IP, ICMP, and UDP. The view also gives you access to firmware attribute information for the Cabletron hub device. If the hub device is connected to other devices, you can access additional attribute information for the connected devices through the Application View HASPART Panel. The following sections describe the Application Views for each Cabletron Ethernet hub.

Figure 7: Main Application View



For more information on this view, refer to the ***MIBs and the Application View*** documentation.

The Application Views for Cabletron Ethernet hubs are similar. There are only two differences:

- The IRBM Hub Application View provides an extra button (the Bridge Databases button), which presents bridging statistics on the IRBM hub.
- The IRM3 Hub Application View provides a UPS button, which displays an Uninterruptible Power Supply (UPS) statistics view.

The Application View for the IRBM, IRM2, IRM3, SIRM, MiniMMAC and MRXI hubs contains the following fields and buttons.

Model Name
The user-defined or default name of the model.

Device Name
The ASCII name of the device read from the device firmware.

Network Address
The network IP address of the device (e.g., 132.127.118.24).

System

This button provides access to the *SNMP System Group View* (Page 29).

UDP

This button provides access to the *SNMP UDP Group View* (Page 29).

ICMP

This button provides access to the *SNMP ICMP Group View* (Page 30).

IP

This button provides access to the *SNMP IP Group View* (Page 31).

Bridge Databases

This button, available only in the IRBM Application View, provides access to the *IRBM MMAC Bridge Database View* (Page 36).

UPS

This button, available only in the IRM3 Application View, provides access to the *UPS Statistics View* (Page 38).

HASPART Panel

The HASPART Panel allows you to access *Performance Views* (Page 41) for the modules installed in the hub. You can either double-click on the name of the module in the HASPART panel, or you can highlight the name and click on OK.

SNMP System Group View

You can access the SNMP System Group View by clicking on the System button in the Application View. The SNMP System Group View provides the following information.

System Descriptor
A textual description of the hub. This description includes the name of the hardware type and the networking software.

System Up Time
The time since the hub network management software was last reinitialized, displayed in the following format: days+hours:minutes:seconds

System Object Id
The Structure of Management Information (SMI) identification of the network management subsystem contained in the hub.

SNMP UDP Group View

You can access the SNMP UDP Group View by clicking on the UDP button in the Application View. The SNMP UDP Group View provides the following information.

In DataGrams
The total number of UDP datagrams delivered to UDP users.

Out DataGrams
The total number of UDP datagrams sent from this entity.

In Errors
The number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.

Msgs with no Ports
The total number of received UDP datagrams for which there was no application at the destination port.

SNMP ICMP Group View

You can access the SNMP ICMP Group View by clicking on the ICMP button in the Application View. The SNMP ICMP Group View displays the following information for the hub.

Messages
Displays the total number of ICMP messages that the hub received or attempted to transmit, including messages containing errors.

Errors
Displays the total number of ICMP messages that the hub received containing errors or did not transmit because of errors.

Dest. Unreachable
Displays the total number of ICMP Destination Unreachable messages received or transmitted by the hub. This indicates that a network or host was unreachable, a protocol was not running, or IP datagram fragmentation was necessary but disallowed because the *Don't Fragment* flag was set.

Time Exceeds
Displays the total number of ICMP Time Exceeded messages received or transmitted by the hub. This indicates that an IP datagram was discarded because its TTL had expired or it was in the reassembly queue for too long.

Parameter Problems
Displays the total number of ICMP parameter problem messages received or transmitted by the hub. This indicates an error in an IP datagram's header.

Src Quench Msgs
Displays the total number of ICMP Source Quench messages received or transmitted by the hub. This indicates that a network device is discarding IP datagrams due to a lack of buffer space.

Redirects
Displays the total number of ICMP Redirect messages received by the hub if it is operating as a host. ICMP redirects are transmitted to the host by a gateway informing the host of another gateway on the same IP network that is closer to the desired transmission destination.

More ICMP Stats...

This button allows you to access an additional SNMP ICMP Group View which provides the following information.

Echo
Displays the total number of times the hub received ICMP Echo Request messages from another network device or transmitted them to another network device. Echo Requests test the availability of a device.

Echo Reply
Displays the total number of times the hub received ICMP Echo Reply messages from a network device to which it transmitted an Echo Request or the total number of times the hub transmitted an Echo Reply to a network device from which it received an Echo Request. Echo Replies confirm availability of a network device.

TimeStamp
Displays the total number of times the hub received ICMP TimeStamp Request Messages from another network device or transmitted them to another network device. TimeStamp Requests test the network time delay between devices.

TimeStamp Reply
Displays the total number of times the hub received ICMP TimeStamp Reply messages from a network device to which it transmitted a TimeStamp Request or the total number of times the hub transmitted a TimeStamp Reply to a network device from which it received a TimeStamp Request. TimeStamp Replies confirm the network time delay between devices.

Addr Mask Request
Displays the total number of times the hub received ICMP Address Mask Request Messages from another network device or transmitted them to another network device. Address Mask Requests are transmitted to determine the subnet address mask associated with a local IP network.

Addr Mask Reply
Displays the total number of times the hub received ICMP Address Mask Reply messages from a network device to which it transmitted an Address Mask Request or the total number of times the hub transmitted an Address Mask Reply to a network device from which it received an Address Mask Request. Address Mask Replies determine the subnet address mask of a local IP network.

SNMP IP Group View

You can access the SNMP IP Group View by clicking on the IP button in the Application View.

The SNMP IP Group View displays the following information.

IP Forwarding
Displays whether the hub is operating as a gateway or a host.

Default TTL
Displays the default Time-To-Live (TTL) value, in seconds, that is found in the IP header of datagrams if a TTL value was not provided by the transport layer protocol.

In Packets
Displays the total number of datagrams received including those with errors.

In Header Errors
Displays the total number of received datagrams discarded due to invalid addresses in their IP headers (e.g., bad checksum, version number mismatch, time-to-live exceeded, etc.).

In Address Errors
Displays the total number of received datagrams discarded due to invalid addresses in the IP header's destination field. If the hub is not acting as a gateway, this field includes datagrams discarded because the destination address was not a local address.

Forward Datagrams
Displays the total number of received datagrams for which the hub, if acting as a gateway, was not their final destination and an attempt was made to route them to this destination. If the hub is not acting as a gateway, this field displays the number of datagrams successfully routed through the IP Route Table.

Unknown Protocol
Displays the total number of locally addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.

In Discards
Displays the total number of received datagrams discarded even though no errors were encountered to prevent their continued processing. Such datagrams may have been discarded to increase buffer space.

In Deliveries
Displays the total number of datagrams successfully delivered.

IP Add Table

This button allows you to access the IP Address Table. This table provides the hub IP address, interface index, subnet mask and broadcast address. The Print button allows you to print out a copy of the table to a printer or a file. Double-clicking on a table entry opens the IP Address Table Information View. Table 6 provides the information displayed by the IP Address Table Information View.

Table 6: IP Address Table Information View Fields

Field	Definition
IP Address	The IP address of the interface.
Interface	The number of the interface.
Net Mask Addr	The subnet mask address of the interface.
Broadcast Addr	The broadcast address of the interface.

IP Route Table

This button allows you to access the IP Route Table. This table provides a description of each transmission route known by the hub. The **Print** button allows you to print out a copy of the table to a printer or a file. Double-clicking on a table entry opens the IP Route Table Information View. Table 7 provides the information displayed by the IP Route Table Information View.

Table 7: IP Route Table Information View Fields

Field	Definition
Destination Addr	The destination IP address of this route. An address of 0.0.0.0 is considered a default route.
Next Hop Addr	The IP address of the next hop on this route.
Interface	The local interface through which the next hop on this route should be reached.
Route Age	The number of seconds since this route was last updated or determined to be correct.
Primary Metric	The primary routing metric for this route. If this metric is not used, its value should be set to -1.
Alternate Metric_2	Alternate routing metric for this route. If this metric is not used, its value should be set to -1.

More IP Stats...

This button allows you to display an additional SNMP IP Group View. Table 8 displays the information supplied by the view.

Table 8: SNMP IP Group View Information

Field	Definition
Out Packets	Displays the total number of transmission requests from the local IP network received by the hub.
Out Discards	Displays the number of transmitted datagrams discarded even though no errors were encountered to prevent their continued processing. Such datagrams may have been discarded to increase buffer space.
Out No Routes	Displays the total number of IP datagrams discarded because no route could be found to transmit them to their destination address.
Reassembly Timeout	Displays the maximum number of seconds that IP datagram fragments are held by the hub while awaiting reassembly.
Reassembled Fragments	Displays the total number of IP datagram fragments received by the hub that needed to be reassembled.

Table 8: SNMP IP Group View Information

Field	Definition
Reassembly OKs	Displays the total number of IP datagram fragments successfully reassembled.
Reassembly Fails	Displays the total number of IP datagram fragment reassembly failures detected by the IP reassembly algorithm due to time out, errors, etc.
Fragment OKs	Displays the total number of IP datagrams that have been successfully fragmented by the hub.
Fragment Fails	Displays the total number of IP datagrams that could not be fragmented by the hub because their Don't Fragment flag was set.
Fragment Creates	Displays the total of IP datagram fragments that have been generated by the hub as a result of fragmentation.

IRBM MMAC Bridge Database View

You can access the IRBM MMAC Bridge Database View by clicking on the Bridge Databases button in the IRBM MMAC Application View. The IRBM MMAC Bridge Database View provides the following information.

Model Name
The user-defined or default name of the IRBM model.

Total Entries
The total number of entries in the acquired database.

Maximum Entries
The maximum number of entries allowed in the acquired database.

Static Entries
The number of addresses added to the acquired database by you or the network manager.

Static Entry Age Lmt
The length of time allowed for a static entry in the acquired database to be inactive before it is dropped from the database. This time is fixed at zero (0).

Dynamic Entries
The number of entries that have been accumulated in the acquired database through the bridge's learning process.

Dynamic Entry Age Lmt
The length of time allowed for a dynamic entry in the acquired database to be inactive before it is dropped from the database.

Erase

This button allows you to erase (set to zero) all entries in the acquired database.

Acquired Database Table

This button allows you to display the IRBM MMAC Acquired Database Table. Table 9 provides the information displayed by the table. The **Print** button allows you to print out a copy of the table to a printer or a file. Double-clicking entries in this table brings up entry-specific information views. The Acquired Database Table View also provides a field in which you can enter a new source address and a button that allows you to select filtering.

To add a new source address to the database, type the address into the New Source Address field below the Acquired Database Table.

Select Filtering

This button allows you to access an IRBM MMAC Filter Selection View that lets you update filter selections for new source addresses.

Table 9: IRBM MMAC Acquired Database Table

Field	Definition
Entry Type	The entry type: Static or Dynamic.
Source Address	The source of this acquired database entry, i.e, the instance.
Port1 Out	The outbound port for packets entering port 1.
Port2 Out	The outbound port for packets entering port 2.

Permanent Database

The following fields and buttons appear under the Permanent Database heading.

Current Entries

The number of entries currently recorded in the bridge's permanent database.

Maximum Entries

The maximum number of entries allowed in the permanent database.

Erase

This button allows you to erase (set to zero) all entries in the permanent database.

Permanent Database Table

This button allows you to display the IRBM MMAC Permanent Database Table. Table 10 provides the information displayed in the table. The **Print** button allows you to print out a copy of the table to a printer or a file. Double-clicking on entries in this table brings up entry-specific information views. The Permanent Database Table View also provides a field in which you can enter a new source address and a button that allows you to select filtering.

To add a new source address to the database, type the address into the New Source Address field below the Permanent Database Table.

Select Filtering

This button allows you to access an IRBM MMAC Filter Selection View that lets you update filter selections for new source addresses.

Table 10: IRBM MMAC Permanent Database Table

Field	Definition
Entry Type	The entry type: Static or Dynamic.
Source Address	The source address of entries allowed in permanent database.
Port1 Out	The outbound port for packets entering port 1.
Port2 Out	The outbound port for packets entering port 2.

UPS Statistics View

You can access the UPS Statistics View by clicking on the UPS button in the IRM3 MMAC Application View. This view provides information on the status of the UPS connected to the IRM3.

The UPS Statistics View contains a multi-attribute line graph that has a scroll bar. You can use this graph to view performance statistics for the UPS. The UPS Statistics View is similar to a hub Performance View. For more information on how to use this type of view, refer to *Performance Views* (Page 41). The UPS Statistics View displays the following information.

Name
The user-defined or default name of the model.

Location
The location of the device as entered in the Creation dialog box when the model was created. If no location has been specified, this field displays the model name of the SPECTRUM location view containing the device.

Network Address
The Internet Protocol (IP) address of the device.

Device Type
The SPECTRUM Model Type (e.g., Hub_CSI_IRM3).

System Up Time
The time, displayed in days+hours:minutes:seconds, that the device has been on-line.

Battery Capacity
The current battery capacity of the UPS. Values are displayed as a percentage. Additional fields show the Average and the Peak Value of this quantity.

Battery Volts Out
The battery output voltage. Additional fields show the Average and the Peak Value of this quantity.

AC Line Volts In
The input line voltage. Additional fields show the Average and the Peak Value of this quantity.

UPS Model

This button allows you to select the Model of UPS in use. Possible selections are: 370, 400, 600, 900, 1250, and 2000. The model assignment is not information gathered from the UPS; rather, it is an assignment made from the IRM3. This model type code needs to be assigned after the cable has been connected between the IRM3 and the UPS and before any access to the UPS MIB can take place.

UPS Status
Displays the test states. Possible states include Unit_OK, Unit_Failed, Bad_Battery, No_Recent_Tests, and Unit_In_Test.

UPS Uptime in Hours
The amount of time that the UPS connected to the IRM3 has been running since start-up.

Test

This button allows you to initiate a test cycle on the UPS device. To place the UPS into test mode, click on Initiate. The UPS Status field updates to reflect the current status of the device.

Scroll to Date-Time

This button allows you to view historical data on UPS performance. Click on this button to set the viewing area of the graph to begin at a specified date and time.

Change Time Scale

This button allows you to specify the Y axis time scale for the graph.

Log/Lin

This button allows you to change how the multi-attribute line graph is displayed. You can display

the network statistics in Logarithmic or Linear format.

Performance Views

This section provides brief descriptions of the Performance views available for the Cabletron ethernet hubs in SPECTRUM.

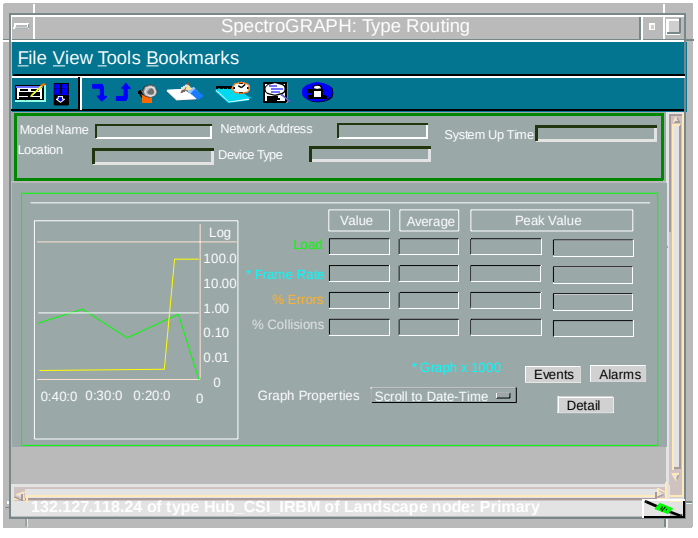
Performance views display performance statistics in terms of a set of transmission attributes, e.g., cell rates, frame rates, % error, etc. A typical view is shown in Figure 8. The instantaneous condition of each transmission attribute is recorded in a graph. The statistical information for each attribute is presented in the adjacent table.

Generally, you determine performance at the device level through Performance views accessed from the Device and Application icons. You determine performance at the port/interface level through Performance views accessed from Interface icons.

For more information on Performance views, refer to the ***SPECTRUM Views*** documentation.

The following paragraphs list the performance attributes displayed for each Performance view supported by this management module.

Figure 8: Performance View



Device Performance View

Access: *From the **Icon Subviews** menu for the Device icon, select **Performance**.*

Current and historical frame transmission information is provided via the following attributes.

- Load
- Frame Rate
- % Errors
- % Collisions
- Active Users (IRM2 and IRM3 only)

MIM Performance View

Access: *From the **Icon Subviews** menu for a selected module label in the Device view, select **Module Performance**.*

Current and historical packet transmission information is provided via the following attributes.

- Load
- Frame Rate
- % Errors
- % Collisions

Port Performance View

Access: *From the **Icon Subviews** menu for a selected port label in the Device view, select **Port Performance**.*

Current and historical packet transmission information is provided via the following attributes.

- Load
- Frame Rate
- % Errors
- % Collisions

Configuration Views

This section describes the various Configuration views available for models of the Cabletron ethernet hubs in SPECTRUM.

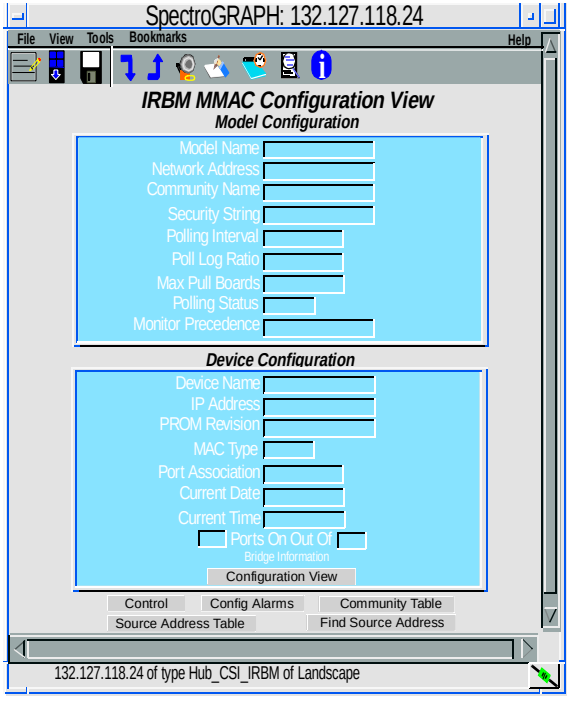
Configuration views let you view and modify current settings for the modeled device and its interfaces, ports, and applications.

Configuration View

Access: *From the **Icon Subviews** menu for the Device icon, select **Configuration**.*

This view (Figure 9) provides status and configuration information about the device as a whole as well as on a port-by-port basis. Fields and column headings within the Configuration view and its subviews are explained in detail in the ***SPECTRUM Views*** documentation.

Figure 9: Device Configuration View



Model Configuration

This area of the Configuration view contains the fields described below.

Model Name
The user-defined or default name of the model.

Network Address
The network IP address (e.g., 132.127.118.24).

Community Name
The Community Name that has been assigned locally to the hub.

Security String
The assigned security string for the device. (Refer to User Security and User Maintenance) for information on setting up security in SPECTRUM.)

Polling Interval
The time, in seconds, between SpectroSERVER polls of the network for the hub model.

Poll Log Ratio
The number of SpectroSERVER polls of a device that occur prior to logging the poll results in the database.

Max Pull Boards
The maximum number of board models allowed in the pulled board list.

Polling Status

This button allows you to disable SpectroSERVER polls of a device by setting Polling Status to False. This button is useful in disabling rollup conditions for minor network events such as workstation power-downs. This button will also set all of the models collected by this hub to false. If set to true, models collected by this hub will be set to true.

Monitor Precedence
The monitor precedence value associated with the device. You must explicitly reset this value to a higher value than that of the existing monitoring point to designate this device as the monitoring point.

Device Configuration

This area of the Configuration view contains the fields described below.

Device Name
The ASCII name of the device that this agent manages.

IP Address
The network IP address (e.g., 132.127.118.24).

PROM Revision
The revision number of the hub firmware.

MMAC Type

The type of MMAC, for example, 3, 5, or 8-slot MMAC (e.g., MMAC3, MMAC5, MMAC8). You supply the MMAC type when you create the icon. The default is MMAC8. This button is not available in the MRXI or the MiniMMAC Configuration Views.

Port Association

This button allows you to select the state of operation of AUI and Fiber ports on the device. This button is not available in the IRM, MRXI, or MiniMMAC Configuration Views. Possible states include some subset of the following states:

- AUI_Brdg\Fiber_Off
- AUI_Off\Fiber_Brdg
- AUI_Brdg\Fiber_Rptr
- AUI_Rptr\Fiber_Brdg
- AUI_Off\Fiber_Rptr
- AUI_Rptr\Fiber_Off

Current Date
A character representation of the current date. This field does not appear in the MRXI Configuration View.

Current Time
The current time of day as measured by the device. This field does not appear in the MRXI Configuration View.

Ports On Out Of
The number of operating ports on the device out of the total number of ports.

Bridge Information

This section of the Configuration View is available only for the IRBM hub. The Configuration View button found in this section accesses the IRBM Bridge Configuration View, which is described later in this chapter.

Configuration View Buttons

This section of the Configuration View contains buttons that provide access to device-specific information views. This section provides the following buttons:

Find Source Address

This button allows you to access the hub's Source Address View, which is described later in this chapter. This button is not available in the IRM or the MRXI Configuration Views.

Source Address Table

This button allows you to access the Device Source Address Table, which is described later in this chapter. This button is not available in the IRM or the MRXI Configuration Views.

Control

This button allows you to access the Control View, which is described later in this chapter.

Config Alarms

This button allows you to access the Configure Alarms View, which is described later in this chapter. This button is not available in the IRM Configuration View.

Redundancy

This button allows you to access the MMAC Redundancy View, which is described later in this chapter. This button is not available in the IRBM or the IRM Configuration Views.

Flash Download

This button allows you to access the Flash DownLoad View. This button is available only in the IRM3, MRXI, and MiniMMAC Configuration Views.

Additional Configuration

This button allows you to access an additional configuration view, which is described later in this chapter. This button is available only in the IRM2 and IRM3 Configuration Views.

Community Table

This button allows you to access the Community and Trap Table View, which is described later in this chapter. This button is available only in the IRM2 and IRM3 Configuration Views.

Source Address View

You can access the Source Address View by clicking on the Find Source Address button in the Configuration View. This view gives you the ability to trace a MAC address to the board and port where the address is detected, and provides the following information. This view is not available for IRM or the MRXI hubs.

Model Name
The user-defined or default name of the model.

Network Address
The network IP address (e.g., 132.127.118.24).

Source Address
User-defined MAC address using the format xx.xx.xx.xx.xx.xx.

Find Board/Port

This button allows you to access the Source Address Board/Port Location View. Table 11 provides the information contained in the view.

Table 11: MMAC Source Address Board/Port Location View Fields

Field	Definition
Model Name	The user-defined or default name of the hub model.
Network Address	The network IP address (e.g., 132.127.118.24).
Source Address	User-defined MAC address using the format xx.xx.xx.xx.xx.xx.
Board Number	The board number where the MAC address is detected.
Port Number	The port number where the MAC address is detected.

Control View

You can access the Control View by clicking the Control button in the Configuration View. This view provides the following information.

Model Name
The user-defined or default name of the hub model. This field does not appear in the IRM Control View.

Device Name
An ASCII name of the device that this agent manages. This field does not appear in the IRM Control View.

Network Address
The network IP address (e.g., 132.127.118.24). This field does not appear in the IRM Control View.

Counters

This button allows you to reset all of the device's counters to 0.

Restart Device

This button allows you to restart the device.

Device Redundancy

This button allows you to reset the redundancy for the entire hub. This button is not available in the IRBM or the IRM Control Views.

Device Discover

This button causes the device and all devices connected to it to send Link-up traps. This button is not available in the IRM, IRM3, or MRXI Control Views.

Source Address Age Time
The number of seconds that a source address is not detected before it is removed from the source address table. This field does not appear in the IRM or MRXI Control Views.

Source Address Traps

This button controls sending of source address related traps. Possible options are TrapsOn and TrapsOff. This button is not available in the IRM or MRXI Control Views.

Source Address Lock

This button indicates whether detection of source addresses on a port that are not in the source address table will cause the port to be turned off. Possible states are LockOff and LockOn. If a port is turned off, an event and alarm will be generated to warn you of this condition. This button is not available in the IRM or MRXI Control Views.

Factory Defaults

This button allows you to reset the device's settings to their factory defaults. This button is only available in the IRM2 and IRM3 Control Views. (Does not affect IP address)

Configure Alarms View

You can access this view by clicking on the Config Alarms button in the Configuration View. This view allows you to set threshold alarms and enable them. The Configure Alarms View is not available for the IRM hub. This view contains the fields described below.

Model Name
The user-defined or default name of the model.

Device Name
The ASCII name of the device read from the device firmware.

Network Address
The network IP address (e.g., 132.127.118.24).

Traffic Alarms

This button allows you to Enable or Disable detection of Traffic Alarms.

Traffic Threshold
The threshold value within the alarm timebase which, once that number of packets is exceeded, generates a traffic alarm.

Collision Alarms

This button allows you to Enable or Disable detection of device-level Collision Alarms.

Collision Threshold
The threshold value within the alarm timebase which, once that number of collisions per good packet is exceeded, generates a collision alarm. Possible values range from 1 to 15.

Error Alarms

This button allows you to Enable or Disable detection of Error Alarms. This button is not available in the MRXI Configure Alarms View.

Error Threshold
The threshold value within the alarm timebase which, once the percentage of errors per good packet is exceeded, generates an error alarm. This field is not available in the MRXI Configure Alarms View.

Broadcast Alarms

This button allows you to Enable or Disable detection of Broadcast Alarms. This button is available only in the IRM2 and IRM3 Configure Alarms Views.

Broadcast Threshold

The threshold value within the alarm timebase which, once that number of broadcasts received is exceeded, generates a broadcast alarm. This field is available only in the IRM2 and IRM3 Configure Alarms Views.

Time Base

The number of seconds used as the interval for performing all of the rate alarm checks. The minimum is 10 seconds. For example, if the time base is 10 seconds, an alarm will occur only when the specified number of errors occurs within 10 seconds.

Audible Alarm

This button allows you to Enable or Disable the audible alarm in the hub. You must have a community name with Read/Write permission to update this feature. This button is available only in the IRM2 and IRM3 Configure Alarms Views.

Sound Audible Alarm

This button permits a management station to turn off a sounding alarm. Attempting to change this button to the **ON** position may result in a write failure error. You must have a community name with Read/Write permission to update this feature. This button is available only in the IRM2 and IRM3 Configure Alarms Views.

Error Source Table

The Configure Alarms View also displays an Error Source Table, which displays a series of buttons which allow you to select the types of errors that will cause alarms. Table 12 (Page 51) provides the definitions of the errors contained in the Error Source Table.

Table 12: Error Source Table Fields

Error	Definition
Align	Measures the number of misaligned frames detected by the hub.
Runts	Measures the number of runt frames detected by the hub.
Giants	Measures the number of packets longer than 1,518 bytes detected by the hub.
CRC	Measures the number of packets with bad Cyclic Redundancy Checks (CRCs) detected.
OOW	Measures the number of Out-Of-Window (OOW) collisions detected by the hub.
No_Resource	Measures the number of No_Resource errors detected by the hub.

Redundancy View

You can access the Redundancy View by clicking on the Redundancy button in the Configuration

View. This view is not available for the IRBM or the IRM hubs. The Redundancy View contains the fields and buttons described below.

Model Name
The user-defined or default name of the model.

Device Name
An ASCII name of the device that this agent manages.

Maximum Circuits
The maximum number of circuits.

Available Circuits
The number of available circuits. This field does not appear in the IRM3 Redundancy View.

Redundant Poll Interval
The number of seconds between polls for redundancy.

Test Redundant Circuits

This button allows you to test the redundant circuit.

Test Time of Day

The time of day at which the redundant circuits should be tested. This field is not available in the MRXI Redundancy View.

Redundancy Table

This button allows you to display the MMAC Redundancy Table. The Redundancy Table allows you to set up redundant circuit connections between any two or more hubs that have redundant capability in their firmware. For more information on setting up redundant circuits, refer to *Hub Redundancy Management* in this chapter.

You can double-click on any of the circuit names in the Redundancy Table to access the MMAC Redundancy Information View. This view lets you set up redundancy circuits. Table 13 provides the information contained in the view.

Table 13: MMAC Redundancy Information View Fields

Field	Definition
Circuit Name	The name of the indicated circuit.
Retry Count	The number of unanswered polls allowed for the indicated circuit before the current connection is declared bad.
Bd/Port Combination	The number of board/port combinations associated with the indicated circuit.
MAC Address Add (IRM2, MRXI, MiniMMAC)	Adds the Ethernet address to the polling list for the indicated circuit.
IP Address Add (IRM3)	Adds the IP address to the polling list for the indicated circuit.
Number of Addresses	The number of addresses associated with the indicated circuit.

Table 13: MMAC Redundancy Information View Fields

Field	Definition
Circuit Enable	Enables or disables the indicated circuit.
Circuit Number	The number from the circuit names in the Redundancy table (e.g., Circuit 04).
Board Port Instance	The board number and port number that the redundant circuit is connected to. For example, 3.6 is board 3, port 6.
Port Circuit Status	The current state of this port in the redundant circuit.
Port Circuit Type	The type of port this port is in the redundant circuit.

Panels at the bottom of the Redundancy Information View provide additional information. For the IRM2, MRXI, and MiniMMAC, the panels are Board Member, Port Member, and Redundancy Table. For the IRM3, there are two Redundancy Table panels. Double-clicking on any of the entries in the Polled Address list of the Redundancy Table for the IRM2, MRXI, or MiniMMAC opens the Address Display View. The Address Display View has two fields: Polled Address, which is the MAC address, and Instance, which is the board number and port number associated with the address. For example, 1.1 is board 1, port 1. The IRM3 has no Address Display View.

The Redundancy Information View also provides the following two buttons:

Address Delete View

The **Address Delete View** button displays the Address Delete View. This view contains the Redundancy Table and a field. Table 14 provides the information contained in the view.

Table 14: Address Delete View Fields

Field	Definition
MAC Address Delete (IRM2), MRXI, MiniMMAC	Removes the Ethernet address from the polling list for the indicated circuit. You enter a MAC address in this field.
IP Address Delete (IRM3)	Removes the IP address from the polling list for the indicated circuit. You enter an IP address in this field.

The IRM2, MRXI, and MiniMMAC Address Delete Views allow you to double-click on the Polled Addresses in the Redundancy Table to access an Address Display View. The Address Display View has two fields: **Polled Address**, which is the MAC address, and **Instance**, which is the board number and port number associated with the address. For example, 1.1 is board 1, port 1.

Reset Circuit View

This button allows you to access the Circuit Reset View. This view allows you to reset a single Redundancy circuit. Table 15 provides the information contained in the view.

Table 15: Circuit Reset View Fields

Field	Definition
Circuit Number	The circuit number to be reset.
Circuit Reset	Resets the indicated circuit.

Flash Download View

You can access the Flash Download View by clicking on the Flash Download button in the Configuration View. This view is available only for the IRM3, the MRXI, and the MiniMMAC hubs. The Flash Download View displays the following information.

Model Name
The user-defined or default name of the hub model.

Network Address
The network IP address (e.g., 132.127.118.24).

Last Image Filename
The filename of the last image to be loaded into flash memory successfully.

Last Server IP Address
The IP address of the file server used to load the image presently in flash memory.

Flash Size in Bytes
The size in bytes of the flash memory contained in the module.

Flash Count
The number of times that the flash memory has been reprogrammed. This value is initialized to 1 upon initial power up of the device.

Firmware Base Address
The starting address of the firmware in RAM.

Firmware Top Address
The ending address of the firmware in RAM.

Firmware Start Address

The jump address of the firmware in RAM as established by the boot process.

DownLoad Software

This button allows you to access the DownLoad Software View. This view allows you to upgrade the hub's firmware from a TFTP Boot Server. Table 16 describes the fields provided by this view.

Table 16: DownLoad Software View Field Definitions

Field	Definition
Model Name	The user-defined or default name of the hub model.
Network Address	The network IP address (e.g., 132.127.118.24).

Table 16: DownLoad Software View Field Definitions

Field	Definition
Force On Boot	When set to Server, the boot software will attempt to boot from the TFTP boot server. If no boot is found and flash memory is valid, the device will boot from the flash memory regardless of the setting for this variable. When set to Flash_Memory, the device will boot from flash memory.
TFTP Request Host	A user-defined IP address of the server to be used when the firmware is to be loaded over the network.
TFTP Request FileName	A user-defined filename that is requested of the server when the firmware is to be loaded over the network.
RAM To Flash	When set to Commit, the boot software will erase the flash memory, compress the download code, and save the compressed image into flash memory.

Table 16: DownLoad Software View Field Definitions

Field	Definition
Cold Boot	When set to Initiate, the boot software will initiate a reboot of the system. All MIB variables in this view used to control the exact nature of the download should be set prior to the setting of this variable.

Additional Configuration View

You can access the Additional Configuration View by clicking the Additional Configuration button in the Configuration View. In addition to the model name and network address, this view shows three panels, each with eight slot designations. The panels are labeled Ethernet MIMs, Token Ring MIMs, and FDDI MIMs. When the button next to a slot number is depressed, it means that a MIM of that type is installed in the slot. This view is available only for the IRM2 and IRM3 hubs.

Community and Trap Table

You can access the Community and Trap Table by clicking the Community Table in the Configuration View. The Sort buttons allow you to alter the display format of the table. The Find button allows you to search the name column to locate a specific community name. Clicking on a column heading allows you to access the Sort and Find Buttons. The Update button allows you to update the contents of the table. Double-clicking on any entry in the Community and Trap Table opens the Community Table Detail View specific to the selected table entry. This view allows you to modify the statistics and parameters for the device. Table 4-7 provides definitions of the Community Table Detail View. The Community and Trap Table is available only for the IRM2 and IRM3 hubs. This table provides the following information.

Note: You must have Administrative Privileges to access the Community and Trap Table View and all subviews. Without superuser access you cannot access or change any of the information displayed in this view.

Name
Displays the community name.

Access
Displays the user access permissions.

Traps
Displays the current status of traps. Possible values are enabled or disabled.

IP Addr
Displays the trap host IP address. This is the IP address traps are sent to if they are enabled.

Table 17: Community Table Detail View Field Definitions

Field	Definition
Device Name	The name of the physical device.

Table 17: Community Table Detail View Field Definitions

Field	Definition
Model Name	The user-defined or default name of the hub model.
Community String	The current community name.
Access	The user access permissions for the community name. Possible values are: none, readonly, readwrite, and superuser.
Trap Host	The IP address of the host to which traps will be sent.
Traps	Toggles trap generation. Possible values are: enabled or disabled.

Bridge Configuration View

Access: *From the Bridge Information section of the Configuration View, click on* ***Configuration View****.*

This view is available only for the IRBM hub. The IRBM Bridge Configuration View is divided into two sections: Model Configuration and Device Configuration. In addition, buttons at the bottom of the screen provide access to more detailed informational views.

Model Configuration

This section of the Bridge Configuration View provides the following information.

Model Name
The user-defined or default model name.

Network Address
The network IP address (e.g., 132.127.118.24).

Community Name
The Community Name that has been assigned locally to the hub.

Security String
The IRBM's assigned security string. (Refer to User Security and User Maintenance for information on setting up security in SPECTRUM.)

Polling Interval
The time, in seconds, between SpectroSERVER polls of the network for the hub model.

Poll Log Ratio
The number of SpectroSERVER polls of a device that occur prior to logging the poll results in the database.

Device Configuration

This section of the Bridge Configuration View contains the fields described below.

Bridge Name
The user-defined name of the bridge. The default is ETHERNET BRIDGE.

Bridge Type
The type of bridge (e.g., NB25E, IRBM, or NB20E).

Bridge Location
The user-defined name to indicate the location of the bridge on the network. The default location is LOCAL.

Firmware Version
The release version of the firmware installed in the bridge.

Number of Ports
The number of ports present on the bridge.

Configuration View Buttons

This section of the Bridge Configuration View contains buttons that provide access to more specific information views. This section provides the following buttons.

Bridge/Root Information

This button allows you to access the Bridge/Root Information View. Table 18 provides the information contained in the view.

Table 18: SNMP ICMP Group View Fields

Field	Definition
Model Name	The user-defined or default name of the model.
Root Bridge ID	The unique identifier of the bridge recorded as the root.
Root Port	The port identifier for the port that provides the lowest cost path to the root (i.e., that port for which the sum of values of the designated cost and path cost parameters held for the port is lowest).
Root Cost	The cost of the path to the root from this bridge.
Root Brdg Max Age	The value of the Max Age parameter when the bridge is the root or is attempting to become the root. A time of 6 to 40 seconds is allowed. The default is 20 seconds.

Additional Bridge Information

This button allows you to access the Additional Bridge Information View. Table 19 provides the information contained in the view.

Table 19: Additional Bridge Information View Fields

Field	Definition
Model Name	The user-defined name or default name of the model.
Bridge Priority	The part of the bridge address that contains the identifier used in the spanning tree for priority comparisons. The allowed range is 0 through FFFF. The default is 8000.
Hold Time	The minimum time period elapsing between the transmission of configuration BPDUs through a given bridge port.
Protocol Max Age	The maximum age of received protocol information before it is discarded.
Trap Type Obj ID	Contains the object identifier of the first VarBinding in the last trap generated by the bridge.

Bridge Setup Information

This button allows you to access the Setup Information View. Table 20 provides the information contained in the view.

Table 20: Setup Information View Fields

Field	Definition
Model Name	The user-defined name or default of the model.

Table 20: Setup Information View Fields

Field	Definition
Bridge ID	The unique identifier of the bridge. The first two bytes of the identifier are the bridge priority and the last six bytes are the Ethernet address.
Switch Settings	The current switch settings read from the bridge hardware.
Number of Restarts	The number of times the bridge has been powered up or restarted.
Type of Filtering	The type of filtering to be performed by the bridge. The default is IEEE 802.1.
STA Protocol	The spanning tree algorithm under which the bridge is operating. Selections include: 802.1-compliant spanning tree algorithm environment (802.1), DEC LAN Bridge 100 environment (DEC) and without spanning tree algorithm enabled (None). The default is 802.1.

Topology Information

This button allows you to access the Topology Information View. Table 21 provides the information contained in the view.

Table 21: Topology Information View Table Fields

Field	Definition
Model Name	The user-defined or default name of the model.
Time Topology Change	The time in seconds that has elapsed since the bridge's Topology Change Flag last recorded the value of a topology change.
Topology Change	Indicates if a bridge Topology change is in progress.
Topology Change Count	The number of times the bridge's Topology Change Flag has been changed since the bridge was powered up or initialized.

Fwd Dly & Hello Information

This button allows you to access the Forward Delay & Hello Information View. Table 22 (Page 63) provides the information contained in the view.

Table 22: Forward Delay & Hello Information View Fields

Field	Definition
Model Name	The user-defined or default name of the model.
Forward Delay Parm	The value of the forward delay parameters when the bridge is the root or attempting to become root. A time of 4 to 30 seconds is allowed.
Forward Delay	The time spent in the listening state while moving from the blocking state to the learning state, or the time spent in the learning state while moving from the listening state to the forwarding state.
Hello Time Parm	The value of the Hello Time parameter when the bridge is the root or is attempting to become the root. A time of 1 to 10 seconds is allowed. The default is 2 seconds.
Hello Time	The time interval between the transmission of Configuration BPDUs by a bridge that is attempting to become the root.

Control

This button allows you to access the IRBM Bridge Control View. Table 23 provides the information contained in the view.

Table 23: IRBM Bridge Control View Fields

Field	Definition
Current Bridge Status	The status of the bridge, for example, ON-LINE, STAND BY, or DISABLED.
Bridge Status Control	Enables or disables the bridge.
Bridge Restart	Forces the bridge to undergo a software reset.
Bridge Settings	Restores the bridge settings to their default values.

Hub Redundancy Management

The hub redundancy management features described in this section include information specific to the following Cabletron hub devices:

- IRM2
- IRM3

- MRXI
- MiniMMAC

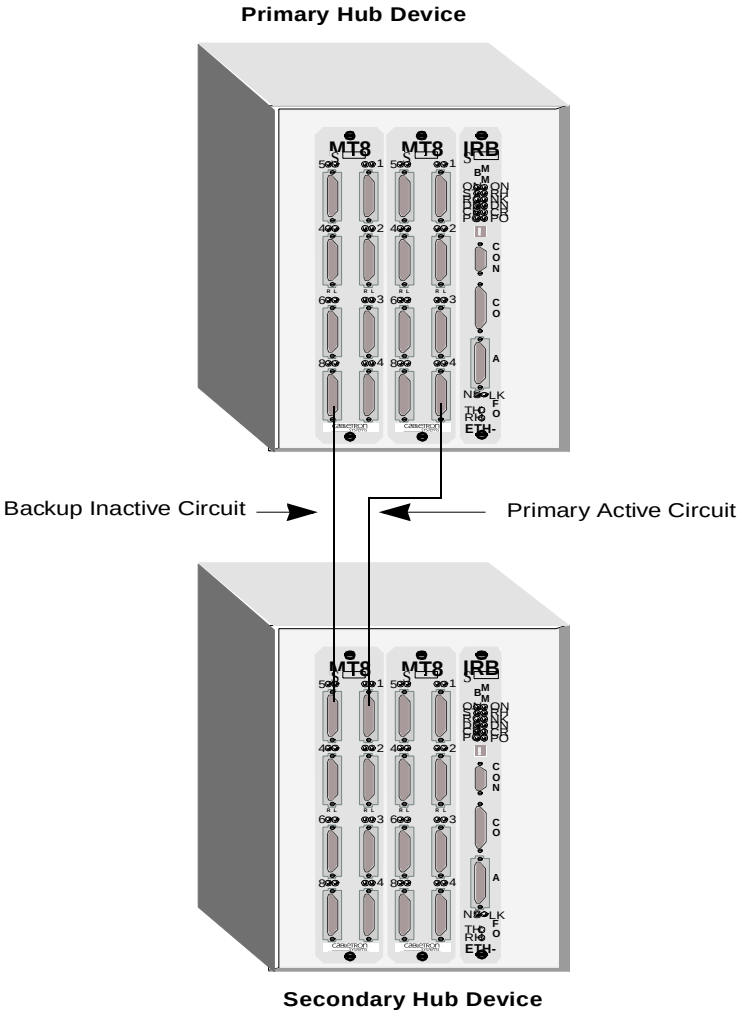
Note: The SIRM and the IRBM hub devices do not have redundant circuit compatibility available in their device firmware.

SPECTRUM allows redundant “circuit” connections between any two or more hub devices that have redundant capability in their firmware. A circuit is represented by a cable connection from one module port on a primary hub device to one or more module ports on secondary hub devices. The cable connections can use any valid cable type, including thin-net, coaxial, fiber optic, or AUI. The terminating connectors used depend on the type of cable connecting the module ports.

Any two or more cable connections create a complete circular “circuit” pathway between the two devices. One pathway is always set up as primary and the others as secondary. The secondary circuit becomes active if the primary pathway fails. This allows the primary hub device to repeat data packet information on an alternative module port if a problem exists on the primary port.

Although circuit connections typically occur between devices in the same room, the circuit connections can also occur over longer distances between floors or buildings (with the proper FDDI cables and associated modules). Refer to Figure 10 (Page 65) for an illustration of a typical redundant cable circuit connection between two redundant hub devices.

Figure 10: Redundantly Connected Hub Device



The following example illustrates redundancy between hubs.

Say that you have used redundant circuit management to create a connection between the Accounting Department and the Payroll Department of your company. These departments are on the same floor and have two repeaters between them on an Ethernet network. Suppose a system overload occurred when you were sending direct deposit payroll information from the Payroll Department to the Accounting Department the night before payday. This could be a disastrous situation.

Redundant circuit management would prevent this situation by allowing the primary hub device to automatically switch from the primary circuit to the secondary circuit. The backup circuit would become active and continue sending data over its cable connection. Redundancy becomes especially important for unattended night time batch jobs, or for jobs where a communications problem could seriously interfere with normal business operations.

Setting Redundant Circuits

The following procedure uses an IRM2 hub device as an example. However, this procedure can also

be used with MRXI and MiniMMAC hubs as primary devices. The secondary device can be any hub device with redundancy capability (e.g., MRXI, MiniMMAC, IRM2, IRM3). This procedure may also be used to configure multiple secondary hub devices.

Note:

These instructions assume that you have a primary MMAC hub module port physically attached to a secondary MMAC hub module port. Both these modules must have redundant circuit capability. The backup port connection cannot be completed until you have set up the active connection in SPECTRUM. For convenience, you should also prepare a list of secondary hub Ethernet addresses before beginning this procedure.

Also, SNMP devices require the use of the Community Name attribute. The SPECTRUM default of “public” grants read-only privileges, which allow you to view device attributes, but not modify them. Since setting up redundancy requires modifying the device attributes, you should set the Community Name to “ctron,” which grants read/write privileges. You can set the Community Name when you create the device or change it in the Device Configuration View.

To set redundant circuits for the devices modeled in SPECTRUM, follow these steps:

1. Click on the icon to select it.
2. If contact has been established and the icon is green, bring up the Configuration View.
3. From the Configuration View menu, click on the **Redundancy** button. In the Redundancy View window, click on **Redundancy Table**.
4. Choose any circuit from the Circuit Name list that appears by double-clicking on it. A Redundancy Information View window appears.
5. Set the Retry Count to any value between 1 and 10, inclusive.
6. For any of the devices other than the IRM-3 enter the Ethernet address of the secondary hub device, which will be polled, in the MAC Address Add field. This field should allow you to enter the address in any of the following formats (where X is any hexadecimal value from 0 to F):
   - XX.XX.XX.XX.XX.XX
   - XX:XX:XX:XX:XX:XX
   - XX-XX-XX-XX-XX-XX

   For the IRM-3, enter the IP address of the secondary hub device, which will be polled, in the IP Address Add field. You should enter this address in the format NNN.NNN.NNN.NNN (where NNN is a decimal number from 0 to 255).
7. Enter the Board Port Instance for the primary connection. For example, if the primary connection is on port 4 of a module in the device's fifth slot, the Board Port Instance would be 5.4. (Modules on these devices start from 1 and can go up to 8 depending on the MMAC type.)
8. Change the Port Circuit Status to **Active** and the Port Circuit Type to **Primary**.
9. Choose **Save All Changes** from the File menu. This will save the circuit configuration you entered.
10. Now change the Board Port Instance to represent the backup connection. Change the Port Circuit Status to **Inactive** and the Port Circuit Type to **Backup**.
11. Choose **Save All Changes** from the File menu. This will save the circuit configuration you entered for the backup connection.
12. Close this Redundancy Information View and then bring it up again. Verify that the

redundancy setup information is present and correct.

13 Click on the **Circuit Enable** field and choose **Enable**. This enables the circuit that was created on the primary hub device. Choose **Save All Changes** from the File menu.

14 Now physically connect the secondary circuit between the two hub devices. To test the redundancy, disconnect the primary circuit and make sure the backup circuit becomes active.

Diagnostic View

This section provides a brief overview of the Diagnostic view.

Access: *From the **Icon Subviews** menu for the Device icon, select **Diagnostic**.*

Note: There is no Diagnostic View for the IRBM, IRM2, IRM3, or MiniMMAC hub. Following the procedure to open the Diagnostic View will open the hub Performance View instead.

This view provides a complete breakdown of network errors gathered by the Cabletron hub on a network segment. Each error attribute is summarized over two intervals: the Total number counted since the device was powered on; and the Last Poll, which is the number counted since the last poll.

The Cabletron hub Diagnostic View provides the following navigational features:

- Buttons allow you to access increasingly detailed views of network information, to select a graphical representation for the error attributes, and to bring up the Events and Alarms Log Views.
- Table entries within views provide double-click zones, which navigate you to device-specific Information Views.

SIRM Hub
The Cabletron SIRM MMAC Diagnostic View provides the following information.

Model Name
The user-defined or default name of the model.

Device Name
The ASCII name of the device read from the device firmware.

Network Address
The network IP address (e.g., 132.127.118.24).

Total
The total number of collisions counted since the device was powered on.

Last Poll
The number of collisions counted since the last poll.

Total Collisions

This button displays a graph showing SIRM MMAC Hub Collisions. The graph has a scroll bar that allows you to view the history of the hub collision statistics. The bottom axis of the graph shows the time in seconds broken into five minute intervals. The right axis shows the rate of collisions that occurred in the last polling interval. There is also a small box on the graph that shows the rate of collisions counted during that last polling interval.

Events

This button allows you to access the Event Log containing a list of network events specific to the hub. You can scroll through the Event Log using the menu or the scroll bars.

Alarms

This button allows you to access the IRM MMAC Alarms View. The Alarms View displays a list of current network alarms. For information on how to use the Alarms View, refer to ***Enterprise Alarm Manager***.

MRXI Hubs

The Cabletron MRXI Hub Diagnostic View provides the following information.

Model Name
The user-defined or default name of the model.

Device Name
The ASCII name of the device read from the device firmware.

Total (Receive Collisions)
The total number of receive collisions detected by the MRXI Hub.

Total (Transmit Collisions)
The total number of transmit collisions detected by the MRXI Hub.

Last Poll (Transmit Collisions)
The number of transmit collisions detected by the MRXI Hub since SPECTRUM last polled the device.

Last Poll (Receive Collisions)
The number of receive collisions detected by the MRXI Hub since SPECTRUM last polled the device.

Receive Collisions

This button allows you to access a graph showing MRXI Hub Receive Collisions. The graph has a scroll bar that allows you to view the history of the hub collision statistics. The bottom axis of the graph shows the time in seconds broken into five minute intervals. The right axis shows the rate of collisions that occurred in the last polling interval. There is also a small box on the graph that shows the rate of collisions counted during that last polling interval.

Transmit Collisions

This button allows you to access a graph showing MRXI Hub Transmit Collisions. The graph has a scroll bar that allows you to view the history of the hub collision statistics. The bottom axis of the graph shows the time in seconds broken into five minute intervals. The right axis shows the rate of collisions that occurred in the last polling interval. There is also a small box on the graph that shows the rate of collisions counted during that last polling interval.

Events

This button allows you to access the Event Log containing a list of network events specific to the hub. You can scroll through the Event Log using the menu or the scroll bars.

Alarms

This button displays the MRXI MMAC Alarms View. The Alarms View displays a list of current network alarms. For information on how to use the Alarms View, refer to the ***SPECTRUM Operator's Reference***.

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